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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/680,471	10/06/2000	Lorenzo Williams	0459-0490P	8775

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EXAMINER

GAKH, YELENA G

ART UNIT	PAPER NUMBER
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1743

DATE MAILED: 08/01/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/680,471

Applicant(s)

WILLIAMS, LORENZO

Examiner

Yelena G. Gakh, Ph.D.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-30 and 32-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2,4-30 and 32-39 is/are rejected.
- 7) ☒ Claim(s) 4,5 and 37-39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 10 May 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

DETAILED ACTION

1. The amendment, formal drawings, and prior document, filed on 05/10/02, are acknowledged. Claims 3 and 31 are cancelled without prejudice. Claims 1,2 4-30 and 32-39 are pending in the application.

Response to Amendment

2. The rejections over the prior art and the objections established in the previous Office action are withdrawn in view of the amendment and the Applicants' arguments.

A new set of rejections is set forth in the present Office action.

Double Patenting

3. Claim 5 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 4. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Objections

4. Claims 4, 5 and 37-39 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 1 assumes that the chemical reagents are introduced into the bulk of the stationary phase to provide the reaction mixture, and therefore claims 4 and 5 do not recite any further limitations into claim 1.

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Claims 37 and 38 recite, "the screening step involves either a microorganism or an enzyme", which is not a limitation directed toward the method steps. There should be a method step, which recites an action upon a microorganism or an enzyme.

Claim 39 recites detection of catalytic activity, however no catalysts are recited in the parent claims, which makes the claim improperly dependent on the parent claims.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 2, 4-30, and 32-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recite "said chemical reaction involving a reaction mixture including chemical reagents", which arises the same question, raised in the previous Office action, as to what is meant by the expression "the reaction mixture including chemical reagents". Reaction mixtures always include chemical reagents; therefore, it is not clear, what is meant by emphasizing this in the claim.

Claim 37 and 38 recite, "the screening step involves a microorganism or an enzyme", however, they do not recite, how the microorganism or enzyme is involved in the screening step, which renders the claims unclear and indefinite.

Claim 39 recites detection of catalytic activity, however, it is not clear, the catalytic activity of what is meant in the claim, as no catalysts are recited in the parent claims.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. **Claims 1, 4-10, 12, 21, 24-27 and 32-37** are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshioka (JP 03099264).

Yoshioka teaches "a novel method for sequencing protein or polypeptide by TLC of amino acids released by modified Edman degradation" (Title). The "method comprises: (1) spotting N samples on a porous glass TLC plate; (2) hydrolyzing the Nth sample spot by the Edman reaction to degrade 1 peptide from the sample, hydrolyzing the unreacted (N-1)th sample and the reacted Nth sample by the same reaction to degrade 1 peptide from each sample, and repeating the degradation until sufficient samples are degraded; (3) dansylating and separating all the dansylated peptides by TLC on a glass plate; and (4) detecting the sequences of the sample protein or polypeptide. In Edman degradation, 2-mercaptoethanol, Ph isothiocyanate and trifluoroacetic acid are added to the spotted samples. Sequencing of lysozyme is given as an example" (Abstract).

9. **Claims 1, 4-10, 12, 21, 24-27 and 32-37** are rejected under 35 U.S.C. 102(b) as being anticipated by Frank (Tetrahedron, IDS).

Frank discloses a method for preparing and screening a plurality of compounds on a matrix support by synthesizing the compounds on a stationary phase, separating them by biochemical methods and screening the separated compounds, described in "Antibody Binding Assay". Frank states, "the spot-synthesis is a technically very easy and straightforward method. The quality of the peptides prepared by this method is remarkably good and sufficient for most biological studies. Peptides up to ? (*the page copy misses the right side, Ex.*) residues in length have been successfully prepared. ... The spot-method provides a simpler, more economic and rapid access to large numbers of peptide sequences at the nmol to μ mol scale for biological screening purposes. Moreover, it offers a degree of flexibility concerning arrangement, scale and number of syntheses per area of supporting sheet. Miniaturization should allow to accommodate up to a hundred spots per 1 cm and several thousands peptides **may be screened on a reasonably small sheet**. Like other parallel SMPS techniques, it lends to automation. Work in this direction is in progress. At present, the application of spot-synthesis in areas of peptide research is being tested, such as in the analysis of the sequence specificity of protein modifying

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enzymes, the screening of hormone derived peptide mimetica etc. In principle, the spot technique should also be applicable to the stepwise parallel assembly of other oligomers, e.g. oligonucleotides provided that the chemistry allows such a simple handling of reagent” (Conclusions).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. **Claims 2, 18, and 29-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka or Frank in view of Reed (US 5,332,665).

Yoshioka or Frank does not specifically teach using polyacrylamide and electrophoresis for separating compounds.

Reed teaches immunoblot analysis of binding specificity of monoclonal antibodies, using electrophoresis on 12% polyacrylamide gels as a separation step and autoradiography as a method for analysis.

It would have been obvious for anyone of ordinary skill to modify Yoshioka/Frank's method by using electrophoresis on polyacrylamide gel, as disclosed by Reed, because it is one of the major techniques of separation in biochemistry along with TLC. It would have been

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obvious for anyone of ordinary skill to use autoradiography as a method for analysis, as taught by Reed, because this is one of the conventional analytical techniques in biochemistry.

13. **Claims 11, 15-17, 19-23, and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka or Frank in view of Soljic et al. (Kemija u Industriji).

Yoshioka or Frank does not specifically disclose performing various syntheses in parallel on the same TLV plate, a stationary phase comprising silica gel or aluminum oxide, dispersed onto or between an inert backing and the liquid phase of claim 28.

Soljic discloses a study of "the reactions of the following inorganic ions: Au^{3+} , Ce^{4+} , Ga^{3+} , Ga^{3+} , Ge(IV) , Pt^{4+} , Rb^{3+} , Se(IV) , Si(IV) , Th^{4+} , Ti^{+} , UO^{22+} , V^{5+} and W(VI) with numerous organic reagents on microcrystalline cellulose and silica gel thin layers. Reagents were dissolved in organic solvents, most frequently in ethanol. Procedure described is as follows: "one drop of cation solution was spotted on cellulose layer and one on silica gel layer, spots were dried and both sprayed with the same reagent solution, and exposed to NH_3 vapor (and sometimes to UV light). ... The results showed different behavior of majority studied reagents on cellulose and on silica gel thin layers; the spot colors and the possibility of colored spots formation are very different on these two sorbents. The differences are esp. dependent on acidity (basicity) of medium. It is included from results obtained that sorbent influences the reaction between ion and org. reagent; with electron forces of its particles the sorbent acts to complex (compound) and products such conditions for the absorption of particular wavelengths of electromagnetic spectrum, and thus it takes part in formation of the spot color. The results obtained in this study are applicable in qualitative and quantitative analyses of mentioned ions, in the 1st place in planar chromatography, and also in spot test reactions, spectrophotometry etc." (Abstract).

It would have been obvious for anyone of ordinary skill in the art to modify Yoshioka/Frank's method to perform different synthesis on the same TLC plate, because Soljic demonstrated the efficiency of performing multiple reactions with different reagents on the same TLC plate. It would have been obvious to use baking glass or plastic basis for the silica gel or aluminium oxide, dispersed on the baking, because these are standard TLC plates.

It would have been obvious for anyone of ordinary skill in the art to use any of the liquid phase mixtures of claim 28, because choosing the solvent mixture for developing TLC plate is a routine procedure in analytical chemistry.

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14. **Claims 13, 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka or Frank in view of Hudak (US 6,034,361).

Yoshioka or Frank does not teach microwave-assisted synthesis.

Hudak emphasizes in the Background of the Invention, that using microwave heating to promote the progress of one or more sample preparation steps or chemical synthesis steps is well known in the art (col.1, lines 14-16).

It would have been obvious for anyone of ordinary skill to add microwave heating for assisting chemical reactions in Yoshioka/Frank's method, because it is a well known technique of improving the efficiency of syntheses, as pointed out by Hudak. It would have been obvious to place the bulk of the stationary phase with the reagents into a microwave cave to provide such heating.

Response to Arguments

15. Applicant's arguments filed 05/10/02 have been fully considered but they are not completely persuasive. Regarding the rejection over the prior art, the examiner agrees with the Applicant that Margotat does not teach a synthesis on a TLC plate - a conclusion, which was difficult to draw on the basis of the abstract of the reference, which was available to the examiner at the time of writing the first Office action. The full reference confirms the Applicant's argument, and therefore this rejection is withdrawn. As for the argument regarding the screening step, the screening step is a part of any TLC analysis, since adding spraying reagents to reveal colors of the spots after TLC separation, as well as developing TLC plates in UV, are the screening methods. Moreover, Frank directly addresses a screening step in his method, as demonstrated above.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yelena G. Gakh, Ph.D. whose telephone number is (703) 306-5906. The examiner can normally be reached on 9:30am-6:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (703) 308-4037. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7165 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

YG
July 29, 2002


Jill Warden
Supervisory Patent Examiner
Technology Center 1700